The Scientific World Journal 2012 vol.2012

Extracellular membrane vesicles and phytopathogenicity of Acholeplasma laidlawii PG8

Chernov V., Chernova O., Mouzykantov A., Baranova N., Gorshkov O., Trushin M., Nesterova T., Ponomareva A.

Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

For the first time, the phytopathogenicity of extracellular vesicles of Acholeplasma laidlawii PG8 (a ubiquitous mycoplasma that is one of the five common species of cell culture contaminants and is a causative agent for phytomycoplasmoses) in Oryza sativa L. plants was studied. Data on the ability of extracellular vesicles of Acholeplasma laidlawii PG8 to penetrate from the nutrient medium into overground parts of Oryza sativa L. through the root system and to cause alterations in ultrastructural organization of the plants were presented. As a result of the analysis of ultrathin leaf sections of plants grown in medium with A. laidlawii PG8 vesicles, we detected significant changes in tissue ultrastructure characteristic to oxidative stress in plants as well as their cultivation along with bacterial cells. The presence of nucleotide sequences of some mycoplasma genes within extracellular vesicles of Acholeplasma laidlawii PG8 allowed a possibility to use PCR (with the following sequencing) to perform differential detection of cells and bacterial vesicles in samples under study. The obtained data may suggest the ability of extracellular vesicles of the mycoplasma to display in plants the features of infection from the viewpoint of virulence criteria - invasivity, infectivity - and toxigenicity - and to favor to bacterial phytopathogenicity.

http://dx.doi.org/10.1100/2012/315474